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Title: Experiments with the full configuration interaction quantum Monte Carlo method

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A couple of years ago, Booth, Thom and Alavi (J. Chem. Phys. 131, 054106 (2009)) introduced a new method for solving the Schroedinger equation for systems of interacting electrons. Their full configuration-interaction quantum Monte Carlo (FCIQMC) method works very well, allowing exact FCI results to be obtained for significantly larger molecules and basis sets than rival methods that have been under continuous development for 40 years or more. FCIQMC is still so new that little is known about its strengths and weaknesses or why it works so well. The aim of this work was to gain insight by applying FCIQMC to model many-electron systems. We present preliminary results for the Hubbard and Heisenberg models, introduce a continuous-time formulation of the FCIQMC algorithm, and explain the nature of the sign problem in FCIQMC and the characteristic walker population dynamics.